

# PATENT SPECIFICATION



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## COMPLETE SPECIFICATION.

### A New or Improved Horizontally Arranged Self-feathering Propeller.

We, ERNEST STRIKE DARLEY, Engineer, of "Penlee", Langwith Drive, Langwith, Derbyshire, and GEORGE WILLIAM ENGLAND, Engineer, of 3, Neath Road, 5 Whitehall, Bristol, both British subjects, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following

statement:—

This invention relates to propellers of ships and aircraft, of the kind wherein the blades revolve in a horizontal plane and are caused (each being free to turn 15 partly round on its own axis) to feather or alternately present the broad surface, and edge, to the water; and in which a cam piece, attached to the bottom of the vessel, engages with anti-friction rollers 20 carried by the blades, to bring the latter into required positions.

Feathering propellers have been formed with a rod projecting from the boss, over which rod the blade rod is fitted, the latter 25 having a circular movement of 90 degrees around said rod projecting from the boss; and it has been proposed to turn the blades on horizontal axes by means of cross arms or tappets, set at right angles 30 to each other and attached to the root of each blade and moving respectively against concentric cam surfaces fixed to the keel of the vessel; and the present invention has for its object certain constructional improvements whereby greater 35 efficiency is obtained than with propellers of this kind, as hitherto constructed.

With the above expressed object in view the present invention consists essentially 40 in the provision of a self-feathering propeller of the kind specified having blades of an oblong form, each of which is provided with a socket at the inner end of the upper edge adapted to slide upon, and

be secured to, a projecting arm of two 45 diameters, of the boss; and with a pair of levers or arms fitted with antifriction rollers fixed to, and projecting from, the inner end thereof, in combination with a cam plate fixed to the bottom of the 50 vessel.

And in order that the invention may be fully understood reference is had to the following description, to the accompanying 55 drawings, and figures and letters of reference marked thereon. In the drawings aforesaid:—

Figure 1 is a plan of a four-bladed propeller constructed in accordance with the 60 present invention.

Figure 2 is an end elevation of the same showing one blade in action and its 65 opposite blade out of action, the intermediate blade being removed to more clearly show the positions assumed by the blades in the course of the revolutions of 65 the propeller.

Figure 3 is an end view of one of the blades with its cam-operated levers 70 thereon; and,

Figure 4 is a plan of the cam plate operating and holding the succeeding 75 blades in action for the required period.

Similar letters of reference indicate 75 like parts where occurring.

In carrying said invention into effect, the propeller blades *a* are attached in the 80 manner hereinafter described to a boss *b* on a vertically arranged driving shaft *c* preferably driven by crown and gear wheels, adapting it particularly to high speed engines.

The boss *b* is formed, or fitted, with projecting arms *d* which are of a reduced 85 diameter at their outer ends, as at *d'* to form a shoulder near the boss, see particularly Figure 2—and to these arms the blades of the propeller are attached. The

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manner effecting the attachment is as shown, blade *a*, which is of an oblong form, having at the inner end of its upper edge a socket *e*, bolted or otherwise affixed thereto, which socket is adapted to slide on to the part *d*<sup>1</sup> of reduced diameter of its respective arm *d* with its end abutting against the shoulder formed by the difference in diameter of said arm, in which position it is firmly held by means of a nut *f* screwed on to the end *d*<sup>1</sup> of the arm *d*. The blades *a* hang loosely on the arms, and each blade as it comes into action is brought into, and kept in, a vertical position so as to expose the whole of its surface to the water for the required period of the propeller's revolution. It is then released and automatically swings into a horizontal position, offering no resistance to the water.

These movements of the propeller blades are accomplished by the levers or arms *g* fixed to and projecting from the inner end of each blade *a* which make contact with a cam plate *h* fixed to the bottom of the vessel or craft, as the propeller is revolved. Each blade as it approaches the cam portion of the plate *h*, and its uppermost arm *g* makes contact therewith, being turned to the vertical or active position, and when it passes same, assuming the horizontal or feathered position.

To reduce friction, the levers or arms *g* are fitted with rollers *i* at their outer ends.

In Figure 3 the peripheries of the rollers *i* are shown higher than the socket

*e*, but it is to be understood that the said periphery may be on the same level as the said socket.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A horizontally arranged self-feathering propeller of the kind specified, having blades of an oblong form, each of which is provided with a socket at the inner end of its upper edge adapted to slide upon and be secured to a projecting arm of two diameters, of the boss, and with a pair of levers or arms fitted with anti-friction rollers fixed to and projecting from the inner end thereof in combination with a cam plate fixed to the bottom of the vessel, substantially as, and for the purpose described, and shown in the accompanying drawings.

2. A horizontally arranged self-feathering propeller, constructed, arranged and operating substantially as hereinbefore described and shown in the accompanying drawings.

Dated the 11th day of May, 1920.

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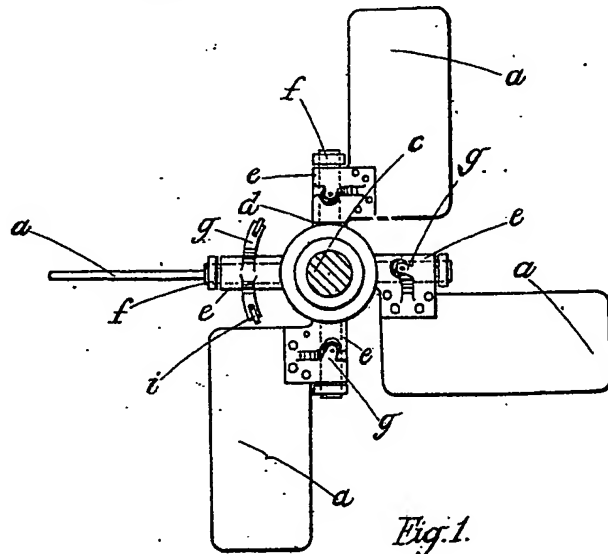


Fig. 1.

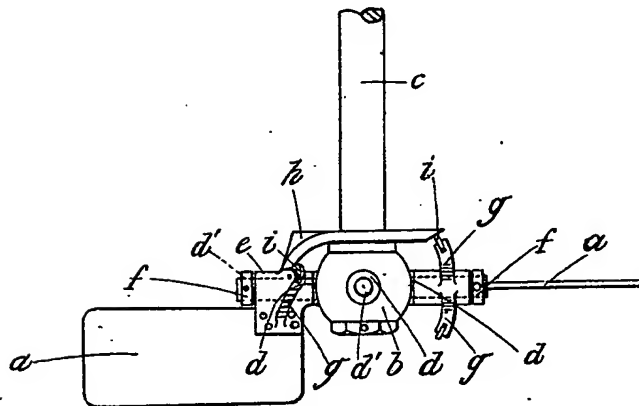


Fig. 2.

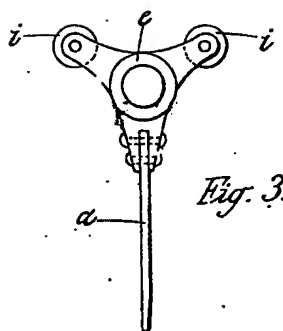


Fig. 3.

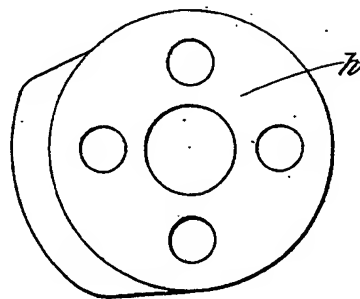


Fig. 4.

Malby & Sons, Photo-Litho.